

REMARKS

Claims 1 and 11-30 remain pending. Independent claim 1 has been amended to distinguish over the prior art of record and is of a scope commensurate to the arguments advanced below for patentability. Accordingly, Applicants respectfully submit that the present application is in condition for allowance.

I. Claim Rejections - 35 USC §102(b) or §103(a)

In the Final Office Action dated August 18, 2008, claims 1, 17, 28 and 29 are rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 5,638,979 issued to Shea, or in the alternative, are rejected under 35 USC §103(a) as being obvious over U.S. Patent No. 5,638,979 issued to Shea.

Shea discloses a “Thermal Reflective Packaging System” (see Title of patent). Thus, it is directed for use in transporting heat-sensitive perishable fruits, such as bananas. The packaging system of Shea has enhanced heat insulating properties provided by a soft and flexible insulating material. For example, the “inner liner” (1) of Shea is described as a “flexible inner liner ... for forming a bag having an opening for insertion of said thermally-sensitive goods” (see claims 1 and 5 and the additional description of the “inner liner” on column 3, lines 38-44, of Shea).

In contrast, the present invention is directed to overcoming an entirely different problem. The present invention relates to a transport box for a relatively-brittle, disc or plate shaped sputtering target. The box is used to transport the sputtering target from the sputtering target manufacturing plant to a workshop having a sputtering chamber where semiconductor thin films are formed. The high purity sputtering targets are expensive, must remain pure and uncontaminated, and can be relatively heavy and/or relatively fragile. Further, during transport, the box may be lifted with industrial forklifts and like machinery, transported on beds of trucks

or like vehicles, and manually transported through sensitive parts of the manufacturing plants and/or workshops. Accordingly, the transport box will be subjected to rough handling yet must be able to protect the fragile sputtering target from breakage, damage and contamination.

For purposes of achieving this goal, the inventors developed a transport box including a rigid retention frame having a void for holding a sputtering target. See FIG. 1, reference numerals 10 and 15, of the present application, as filed. The void closely matches the size of the sputtering target so that the sputtering target is prevented from movement relative to the retention frame. See page 4, line 12, of the present application, as filed. This prevents jostling of the sputtering target within the transport box during rough handling of the transport box.

Further, when supported on a truck bed or the like, the transport box of the present invention is supported in a stable manner on rigid stationary supports. See FIG. 2, reference numeral 25, of the present application, as filed. As best stated on page 5, lines 14-28, of the present application, as filed, this ensures prevention of swaying and other undesired movements of the transport box during shipment. In addition, the supports enable the placement of forks of a forklift truck to be inserted therbetween thereby enabling ready pickup and lifting of the transport box onto or off of the truck bed. See page 5, lines 14-16, of the present application, as filed.

Still further, when the transport box requires manual transport through a building, workshop or the like, it can be tilted onto its rear edge and rolled via a set of wheels located only adjacent the rear edge of the transport box. See FIG. 2, reference numeral 24, of the present application, as filed. The height of the supports are required to be greater than the height (or diameter) of the wheels so that the transport box is supported solely on the supports when located on the truck bed. See page 5, lines 24-28, of the present application, as filed. However, when

manually tilted and/or inclined relative to the underlying floor surface, the transport box can be readily and manually wheeled through the building or workshop.

Finally, the outer box of the transport box must be rigid to perform its intended purpose. See page 4, lines 20-23, of the present application, as filed.

Applicants respectfully submit that Shea fails to disclose, teach or suggest the transport box required by claim 1, as amended, of the present application. In addition, Applicants respectfully submit that it would not be obvious to one of ordinary skill in the art to transport sputtering targets in a manner preventing damage during rough handling based on the teachings of the heat insulating package of Shea.

In the FINAL Office Action, the “inner liner” (1) of Shea is interpreted as being the “sputtering target retention frame” required by claim 1 of the present application. However, claim 1, as amended, of the present application requires the retention frame to be “rigid”, requires a sputtering target to be positioned within the void of the retention frame, and requires the retention frame to prevent movement of the sputtering target relative to the retention frame. No new matter was added; for instance, see FIG. 1 and page 4, lines 11-16, (i.e. “void 15 the size of the sputtering target” and “made from plastic ... cushioning impact on the target”) of the present application, as filed.

Shea clearly fails to disclose, teach or suggest a rigid inner liner, a sputtering target positioned within the inner liner, and an inner liner that has a void matching the size of the sputtering target that thereby prevents movement of the sputtering target relative to the inner liner. In addition, Shea fails to make obvious to one of ordinary skill in the art how to transport fragile disc or plate shaped articles without breakage; rather, Shea merely discloses how to transport perishable goods that must be insulated during transit.

In addition, claim 1 has been amended to require the retention frame to be positioned within the inner box between lower and upper plates such that movement of the retention frame and sputtering target relative to the inner box is prevented. No new matter was added; for instance, see the assembly of reference numerals 10, 11, 12 and 13 in FIG. 1 and page 4, lines 17-19, and page 4, line 30, to page 5, line 3, of the present application, as filed. Shea clearly fails to disclose or provide any motivation for such an assembly.

Further, Shea discloses a “flexible outer shell means forming a bag” (see claims 1 and 5 of Shea). As stated above, the plastic inner box and aluminum or wooden outer box required by claim 1, as amended, of the present application are required to be rigid. No new matter was added; for example, see page 4, lines 5-7 and 20-23, of the present application, as filed. Shea clearly fails to disclose such a combination and fails to provide any motivation for such an assembly.

Still further, in the FINAL Office Action, the “catering cart (33)” embodiment illustrated in FIG. 3 of Shea is relied upon as disclosing the “wheels” required by claim 1 of the present application. In this embodiment of Shea, the catering cart (33) clearly has four wheels at all four corners of the bottom panel of the cart. Thus, the catering cart (33) is always supported on all four wheels and is not designed, nor intended, to be supported on the wheels in an inclined position. In fact, the presence of the thermal panels (35) of FIG. 3 embodiment of Shea would get caught on the wheels of the catering cart if the cart was wheeled in an inclined position and would result in tipping over of the cart thereby damaging the cart and its contents. Also, anything loaded on the cart would fall off the cart if the cart is inclined. Thus, Shea not only fails to teach a cart capable of being wheeled in an inclined position, but also teaches away from transporting the cart and its contents in an inclined position.

In contrast, claim 1, as amended, of the present application requires rigid stationary supports extending from the bottom plate of the transport box and wheels adjacent only a rear edge of the bottom plate and not adjacent an opposite front edge of said bottom plate. No new matter was added; see wheels (24) in FIG. 2D, and page 5, lines 4 to 11, of the present application, as filed. In addition, the height of the supports is required to be greater than the height that the wheels extend from the bottom plate such that the outer box is supported on an underlying floor surface via the supports when the bottom plate extends parallel to the underlying floor surface and such that the outer box is supported on the wheels only when the bottom plate of the outer box is inclined relative to the underlying floor surface. No new matter was added; see supports (25) and wheels (24) in FIG. 2D, and page 4, lines 27-29, and page 5, lines 17 to 28, of the present application, as filed.

None of the embodiments of Shea discloses the claimed combination of supports and wheels, and none discloses that the height of the supports is required to be greater than the height of the wheels. Accordingly, Shea fails to anticipate or obviate claim 1 for these additional reasons.

Accordingly, Applicants respectfully request reconsideration and removal of the §102(b)/§103(a) rejection of claims 1, 17, 28 and 29.

II. Claim Rejections – 35 USC §103(a)

- A. In the FINAL Office Action dated August 18, 2008, claims 11-13, 18 and 22 are rejected under 35 USC §103(a) as being obvious over U.S. Patent No. 5,638,979 issued to Shea.*

Applicants respectfully submit that independent claim 1 is patentable and non-obvious in view of Shea for the reasons discussed above in detail. Accordingly, since claims 11-13, 18 and

22 directly or indirectly depend from base independent claim 1, Applicants submit that these dependent claims are patentable for the same reasons.

As discussed above, Shea discloses a flexible thermally insulated inner liner, a wheeled catering cart with a flexible outer thermal covering, a flexible thermally insulated tote bag, and a flexible thermally insulated bulk bag for loosely holding perishable food items that are sensitive to heat.

In contrast, the present invention is directed to a transport box for a sputtering target used in the manufacture of semiconductors. As disclosed on page 1 of the present application, as filed, sputtering targets can be made of “brittle materials” that can readily be damaged or broken during shipment to a semiconductor manufacturing plant or during handling within the plant. The cost of these fragile sputtering targets is high, thus great financial losses are incurred due to such damage and breakage. The present invention is directed to a transport box that overcomes problems with the transportation and handling of such fragile, expensive sputtering targets.

Claim 1 of the present application requires a “rigid inner sputtering target retention frame defining a void the size of a sputtering target”. The “frame” is rigid and its void matches the target’s shape so that it can maintain the target shape and prevent the target from movement within the transport box during rough handling of the transport box.

Shea clearly fails to disclose, teach, or suggest a rigid sputtering target retention frame defining a void the size of a sputtering target. Shea’s thermal insulating liners provide a volume into which perishables are loosely placed. This space is not shaped to the specific size of the perishable items; rather, Shea simply defines a bulk space. If a brittle article is transported in the thermal insulating containers of Shea, the brittle article is not prevented from shifting within the container and would clearly become damaged due to harsh handling of the container during

transportation and/or handling of the container within a plant. Thus, one of ordinary skill in the art is not fairly taught by Shea how to safely and easily transport and handle fragile, expensive sputtering targets within a semiconductor manufacturing plant in a manner that prevents damage and breakage of the sputtering targets.

Further, claim 1 of the present invention requires the transport box to have a bottom plate with both rigid supports and wheels. Claim 1 requires the height of the supports to be greater than that of the wheels. Thus, when supported in a normal upright position on an underlying surface (such as a truck bed), the supports engage the underlying surface, and the transport box is supported in a stable position on the underlying surface via the supports (not the wheels which permit the box to shift and sway as the truck is being driven). Accordingly, the transport box is positioned in a stable and slip-resistant manner due to the friction between the underlying surface and the supports. The supports also provide areas into which forks of a forklift can be inserted to engage and lift the transport box. However, the transport box according to claim 1 of the present application can also be tilted to an inclined position such that the transport box is supported on an underlying surface on the wheels. In this position, the transport box can be readily wheeled manually about a semiconductor manufacturing plant.

In four of the five embodiments disclosed by Shea, the disclosed transport container neither has supports nor wheels. The embodiment of Shea including wheels merely discloses a conventional catering cart having four wheels, one at each corner. In a proper upright condition, the cart is always supported on an underlying surface via the wheels of the cart. Accordingly, this embodiment clearly fails to disclose the claim limitation of the present application requiring the height of supports to be greater than that of the wheels.

Thus, one of ordinary skill in the art is not fairly taught by Shea how to safely and easily transport and handle fragile, expensive sputtering targets within a semiconductor manufacturing plant in a manner that prevents damage and breakage of the sputtering targets. Shea discloses the use of wheels or no wheels, but fails to disclose the combination of supports and wheels and their arrangement as required by claim 1 of the present application. Accordingly, for at least these reasons, Applicants respectfully submit that claim 1 is patentable and non-obvious relative to Shea.

Accordingly, Applicants respectfully request that this rejection be withdrawn from claims 11-13, 18 and 22.

B. In the Final Office Action dated August 18, 2008, claims 14-16, 19-21 and 23-27 are rejected under 35 USC §103(a) as being obvious over U.S. Patent No. 5,638,979 issued to Shea in view of JP 11-011478.

It is readily admitted in the FINAL Office Action that Shea fails to disclose or obviate an inner box having of a through-type hold. JP '478 is relied upon for this purpose.

However, Applicants respectfully submit that the disclosure of the JP '478 reference has been misinterpreted and reconsideration and removal of the rejection is requested for at least this reason.

In the FINAL Office Action, JP '478 is described as having an inner box (see reference numeral 50 in FIG. 3 of JP '478) having a through-type hold (see reference numeral 68 in FIG. 3 of JP '438). Applicants respectfully submit that reference numeral 68 of JP '478 merely discloses a slot for receiving a fork of a forklift truck. This is different from the through-type hold (reference numeral 14 of FIG. 1 of the present application, as filed) of claims 14, 19, 23 and 26 of the present application which are required to be in a position to simplify removal of the

inner box from the outer box. No new matter was added; for instance, see page 4, lines 24-26, and page 6, lines 15-20, and page 7, lines 2-6, of the present application, as filed.

Thus, for this additional reason, Applicants respectfully submit that claims 14-16, 19-21 and 23-27 are patentable and are not obviated by Shea in view of JP '478. Applicants respectfully request that this rejection be withdrawn.

III. Conclusion

In view of the above amendments and remarks, Applicants respectfully submit that the claim rejections have been overcome and that the present application is in condition for allowance. Thus, a favorable action on the merits is therefore requested.

Please charge any deficiency or credit any overpayment for entering this Amendment to our deposit account no. 08-3040.

Respectfully submitted,
Howson & Howson LLP
Attorneys for Applicants

By William Bak
William Bak
Reg. No. 37,277
501 Office Center Drive
Suite 210
Fort Washington, PA 19034
(215) 540-9216